## Amendments to the Claims

This listing of claims will replace all prior versions and listings of claims in the application.

**Listing of Claims:**

1. (currently amended) A system for non-invasively diagnosing abnormal respiratory function, comprising:

a patient breathing tube;

a flow meter connected to said tube; ~~and~~

a spectrometer interconnected to and in fluid communication with said tube, wherein said spectrometer is adapted to detect the concentration of gases present in said tube; and

data processing means interconnected to said flow meter and said spectrometer, wherein said data processing means is programmed to calculate and display at least one gas concentration ratio selected from the group consisting of the ratio of NO relative to the concentration of CO, the ratio of $CO_2$ to $O_2$ relative to the ratio of NO to CO, the ratio of NO to CO relative to expired volume, the ratio of $CO_2$ to $O_2$ relative to NO, the ratio of $CO_2$ to $O_2$ relative to expired volume, and the ratio of $CO_2$ to $O_2$ simultaneously with a plot of NO relative to expired volume.

2-3. (cancelled).

4. (currently amended) The system of claim [[2]] 1, wherein said ~~second data processing means is programmed to calculate and display~~ gas concentration ratio is the concentration of $CO_2$ relative to the concentration of $O_2$.

5. (currently amended) The system of claim [[2]] 1, wherein said ~~second data processing means is programmed to calculate and display~~ gas concentration ratio is the concentration of NO relative to the concentration of CO.

6. (currently amended) The system of claim [[2]] 1, wherein said ~~second data processing means is programmed to calculate and display~~ gas concentration ratio is the ratio of $CO_2$ to $O_2$ relative to the ratio of NO to CO.

7. (currently amended) The system of claim [[2]] 1, wherein said ~~second data processing means is programmed to calculate and display~~ gas concentration ratio is the ratio of NO to CO relative to expired volume.

8. (currently amended) The system of claim [[2]] 1, wherein said ~~second data processing means is programmed to calculate and display~~ gas concentration ratio is the ratio of $CO_2$ to $O_2$ relative to NO.

9. (currently amended) The system of claim [[2]] 1, wherein said ~~second data processing means is programmed to calculate and display~~ gas concentration ratio is the ratio of $CO_2$ to $O_2$ relative to expired volume.

10. (currently amended) The system of claim [[2]] 1, wherein said ~~second data processing means is programmed to calculate and display~~ gas concentration ratio is the ratio of $CO_2$ to $O_2$ simultaneously with a plot of NO relative to expired volume.

11. (original) ~~The system of claim 2,~~ A system for non-invasively diagnosing abnormal respiratory function, comprising:

a patient breathing tube;

a flow meter connected to said tube;

a spectrometer interconnected to and in fluid communication with said tube, wherein said spectrometer is adapted to detect the concentration of gases present in said tube; and

data processing means interconnected to said flow meter and said spectrometer, wherein said ~~microprocessor~~ data processing means is programmed to phase align the concentrations of said gases to allow for accurate plotting of ratios and concentrations as a function of expired volume.

12. (currently amended) ~~A system for non-invasively diagnosing abnormal respiratory function, comprising:~~

~~a patient breathing tube having a port formed therein;~~

~~a flow meter connected to said tube;~~

The system of claim 1, wherein said spectrometer comprises a laser diode spectrometer remotely interconnected to and in fluid communication with said tube via ~~said~~ a port in said patient breathing tube.

13. (original) The system of claim 12, further comprising a vacuum pump interconnected to said spectrometer and said port.

14. (original) The system of claim 13, wherein said vacuum pump operates at a rate of between about 10 to 100 milliliters per minute.

15. (original) The system of claim 12, wherein said laser diode spectrometer is adapted to measure analyte concentrations of NO, CO, $CO_2$, and $O_2$.

16. (original) The system of claim 12, wherein said laser diode spectrometer simultaneously measures $CO_2$, $O_2$, NO and CO.

17. (original) The system of claim 12, wherein said laser spectrometer alternates between the measurement of any combination of $CO_2$, $O_2$, NO, and CO at a rate of at least twenty times per second for each such molecule.

18. (original) The system of claim 12, wherein said laser spectrometer comprises a monochromatic light source from at least one tunable diode laser operating in a ring-down cavity mode with two or more mirror to increase apparent path length.

19. (original) The system of claim 12, wherein said tube further includes a coupling for attachment to standard ventilator circuits.

20. (original) The system of claim 12, wherein said tube further includes a coupling for attachment to a patient mouthpiece.

21. (original) The system of claim 12, wherein said flow meter is a sensor selected from the group consisting of thermal flow sensors, pressure differential sensors, and ultrasonic flow sensors.

22-45. (cancelled)